

Impact of Media Exposure on Child Health and Development

The amount, type, content, and context of **media exposure** from infancy through adolescence influence **brain and neurological development; cognitive and social development;** and risk behavior factors related to injury, aggression, substance use, sexual health, obesity, and other aspects of **physical development**.

General Information

Broad Focus Area

Social Environment

Background and Justification

There now exists an overwhelming body of evidence indicating that electronic and interactive media comprise a major part of children's lives, even at very young ages. These recent findings have concerned many in the public health community because America's youngest children are immersed in this electronic culture and there is not a clear understanding of how this level of media exposure impacts child health and development. Despite the absence of scientific evidence, the American Academy of Pediatrics has recommended that children under two not watch any television at all and that children over two be limited to one to two hours of educational screen media a day.¹

Many claims exist regarding the impact of the mass media, and especially the newer, more interactive, electronic media, on the health and development of American children. Some suggest that media constitutes a developmental risk factor, while others point to opportunities for enhancing children's positive development.² Given the ubiquitous presence of media in children's lives, it is of great importance to document: a) what aspects of contemporary media have negative (or positive) influences on development; b) at what ages they have those effects; and c) what individual and familial aspects of younger children put them at risk (or opportunity) for such developmental pathways. The outcomes for which media effects are hypothesized are central to the health and development of children and to the priorities of the NCS. These include brain and neurological development; cognitive and social development, risk behaviors factors related to injury, substance use, sexual health; and obesity and other aspects of physical development.

The design of the NCS makes several major advances in media research possible. Much of the prior work on media effects has been cross-sectional, rather than longitudinal, making it difficult to assess the role of media in growth and development over time. While some important exceptions exist (e.g., research on the effects of violent television viewing;³ Anderson and his colleagues' work on educational television viewing;⁴ and the PSID Child Development Supplement Data, CDS I & II, <http://psidonline.isr.umich.edu/CDS/>), little is known about how media use affects children over extended periods of time. No existing research has the capacity to study the effects of media exposures on children's health and development starting at birth. In addition, most of the longitudinal studies conducted to date have relied on convenience samples, locally random samples or some combination of the two. Data drawn from such samples obviate researchers' ability to assess the prevalence of phenomena and differences in impacts across different population groups.

	<p>The importance of longitudinal data in media research is underscored by the challenges inherent in understanding the impact of exposures that become increasingly a function of personal choice as development proceeds. A correlation between exposure to media violence and aggressive behavior in a sample of adolescents conveys no information about possible causal pathways unless one also has information on the prior developmental trajectories of media preferences and exposures and predispositions and behaviors related to aggression. Because it begins at or before birth, the NCS is unique in offering an opportunity to (briefly) measure the effects of media exposures that are controlled by parents, and not children. The potential of these early exposures to influence trajectories of both development and later media consumption can be explored, and these early exposures can be used in causal modeling of media effects later in childhood.</p>
Prevalence/ Incidence	<p>A recent study published by the Kaiser Family Foundation revealed that American children between the ages of 2 and 18 spend an average of 5 hours and 29 minutes each day using media; about 2 hours and 46 minutes of this time is spent watching television.⁵ Over two-thirds of children under the age of two use screen media, spending an average of 2 hours and 5 minutes each day with television, videos, computers, or video games.⁶ Virtually all children experience some exposure to violent media prior to age 10; those in the top quintile of exposure are considered most at risk of long term effects.⁷</p> <p>Regarding potential outcomes:</p> <ul style="list-style-type: none"> -- An increased risk of firearm injuries is one of several potential outcomes of this increased overall exposure. Approximately 24 per 100,000 children are injured by a firearm each year.⁸ -- Another potential outcome is violent or aggressive behavior: data collected by the U.S. Department of Justice indicates that, in 2002, 32% of violent crimes (including threatened and completed acts of violence) were committed by persons aged 20 or younger.⁹ Aggressive behavior can also result in unintentional injury (e.g., from motor vehicle accidents). Motor vehicle crashes are the leading cause of death for 15 to 20 year olds,¹⁰ and CDC cites aggressive driving being implicated in 2/3 of fatal crashes. -- The rate of substance abuse among youths aged 12 to 17 was 8.9% in 2003; among those aged 18 to 25, the figure rose to 21.0%. Illicit drug use was reported by 3.8 percent of youths aged 12 or 13, 10.9% of those aged 14 or 15, and 19.2% of those aged 16 or 17. Recent alcohol use was reported by 29.0% of youths aged 12 to 20.¹¹ -- Obesity is a growing epidemic in the U.S., particularly among children. About 15% of children aged 6-18 are now obese; this figure jumps to 26% for Hispanic and black children.¹² -- The CDC evaluated trends in sexual behavior among U.S. high school students and found that approximately 34% of 9th graders had participated in sexual intercourse; this figure rose to nearly 41% among 10th graders, 52% among 11th graders, and 61% among 12th graders.¹³
Economic Impact	Depends on the specific outcome being investigated

Exposure Measures		Outcome Measures	
Primary/ Parental	Audiovisual media influences: Frequency and content of television viewing, video game, and computer	Primary/ Maternal	

	use			
Methods	Interview; Diaries		Methods	
Life Stage	Periodically, birth through adolescence		Life Stage	
Primary/Child	Audiovisual media influences: Frequency and content of television/movie viewing, video game and computer use		Primary/Child	Various measures of cognitive, social, physical, neurological development collected for various other hypotheses
Methods	Interview; Direct observation; Household surveys; Diaries; Media content analysis		Methods	Various developmental measures; school records; medical records
Life Stage	Periodically, birth through adolescence		Life Stage	Periodically, birth through adolescence

Important Confounders/Covariates	
Socioeconomic status	Higher family income and SES is associated with having a computer in the home. 83% of homes with computers had children's software. Children with computers performed better on tests of school readiness and cognitive development. ¹⁴
Physical Activity	Time spent in front of television, video games, computers, is negatively correlated with time spent in physical activities, therefore increasing risk of obesity. ¹⁵
Psychological Predispositions	Increased use of Internet is associated with negative social development, fewer friends, increase in loneliness and depression, and blurred ability to distinguish real life from simulation. ^{16, 17}
Family structure	Parental unions, household composition, and living arrangements may affect both media use and child outcomes.
Parenting	Less parental monitoring may be associated with patterns of media use and reduced child health and development.

Population of Interest	Estimated Effect that is Detectable
All Children	<p>1) For hypothesis that children who are in the top quintile of exposure to violent media will be 1.5 times more likely to experience a firearm injury during the period from birth to age 21 than are children who are less exposed to violent media, there is a .05 significance level for a difference in odds of 1.5 (top quintile = .008, other quintiles = .005) with a power = .90</p> <p>2) For hypothesis that children from non-English speaking families regularly exposed to English-language educational programming during the preschool years will be 1.5 times more likely to be school ready than children from non-English speaking families who are not regularly exposed to English-language educational programming, there is a .05 level of significance for a difference in odds of 1.5, (17% of children who are regularly exposed to English language educational programming will be</p>

	school-ready relative to 12% of those who are not exposed to English language educational programming) with power of .9
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Other Design Issues

Ethical/Burden Considerations	Interview time is the primary burden for parents and children in this hypothesis. Technologies for monitoring media use may be helpful in reducing burden.
Cost/Complexity of Data Collection	Unique aspect of data collection for this hypothesis includes collecting and archiving samples of various media types including videos, television programs, and video games
Cost of Sample Analysis	Media content analysis (i.e., coding, categorizing, etc. the samples of videos, television programs, video games) can potentially be costly, but can be archived for future analysis using separate funds

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